with other publications). This satisfies the requirement for a concise explanation of the relevance of the foreign language references, according to M.P.E.P. §609 (see e.g. page 600-122, right column, of the August 2001 8th Edition of the M.P.E.P.)

M.P.E.P. §609 also expressly sets forth that references or other information in a non-English language will be considered in view of the submitted explanation of the relevance and insofar as it is understood on its face, for example from the drawings or the like, in the same manner that non-English language information in PTO Search Files is considered by Examiners in conducting searches (see the text bridging pages 600-131 and 600-132 of the August 2001 8th Edition of the M.P.E.P.).

Accordingly, the Examiner is respectfully requested to consider references AD, AE and AI in accordance with the Rules and the M.P.E.P., and to return a fully initialed copy of the IDS Form PTO-1449, together with the next official communication.

3) The Examiner's attention is further directed to applicants' second Information Disclosure Statement being filed by telefax today (December 19, 2002), but separately from the present Response. The Examiner is respectfully requested to consider the references cited in the second Information Disclosure Statement in connection with the next examination of this application. The Examiner is further requested to return an initialed, signed and dated acknowledgment copy of the IDS Form PTO-1449 of December 19, 2002, together with the next official communication.

4) A minor error has been corrected in the specification at page 22. line 16. A Marked-Up Version of the amended portion of the specification is enclosed. The correction does not involve any new matter. Entry of the amendment is respectfully requested.

5) Claim 1 has been amended for clarification. The amendment is supported by the original disclosure at page 5, line 19; page 6, lines 1 to 5; page 7, lines 4 to 9; page 8, line 23 to page 9, line 2; page 12, lines 1 to 3; page 14, lines 15 to 22; etc. No new matter is introduced by this amendment. A Marked-Up Version of amended claim 1 is enclosed. Entry of the amendment is respectfully requested.

6) New claims 27 to 31 have been added. The new claims are supported by the original disclosed subject matter as shown in the following table, and do not introduce any new matter. Entry and consideration of the new claims 27 to 31 are respectfully requested.

New Claims	27	28	29	30	31
Original Support	Cl.1,2,11	Cl.1,2,3,11,14; Figs. 1, 5, 7,8; pg.5,ln.5-10; pg.6,ln.18-21; pg.8,ln.23- pg.9, ln.2; pg. 13, ln.12- pg.14,ln.22	Fig.1	Fig. 5	pg.5, ln.15-19; pg.6, ln.1-5; pg.7, ln.4-9

7) Referring to pages 2 to 5 of the Office Action, the rejection of claims 1 to 5, 7 to 10, 14, 16, 18 to 21 and 23 to 26 as obvious over U. S. Patent 4,691,567 (Himmler et al.) in view of U. S. Patent 4,250,756 (Maus) is respectfully traversed. It is noted

that the Examiner was referring to these references (incorrectly) as "Himmer et al." and "Manus".

8) Present independent claim 1 is directed to an apparatus for determining an unbalance condition of a rotational body.

The apparatus includes a mounting fixture that supports the rotational body to **rotate** about a rotation axis. This is a significant feature of the general class or type of the present apparatus, as will be discussed below.

The apparatus further includes a mounting plate on which the mounting fixture is arranged, and a plurality of webs that connect the mounting plate to an outer frame. Thereby, the webs support the mounting plate relative to the outer frame.

As made clear in the present amendment, the arrangement of the webs is **symmetrical** relative to the rotation axis. Such a symmetrical arrangement of the webs relative to the rotation axis increases the accuracy of the measurement, and avoids the introduction of errors or non-symmetries into the measurement results, for example as explained in the present specification at page 5, lines 15 to 19; page 6, lines 1 to 5; page 7, lines 4 to 9; etc.

Furthermore, the webs are configured and arranged to transmit from the mounting plate to the outer frame **all axially directed forces** oriented along the rotation axis that are not induced by the unbalance of the rotational body. Namely, since all of the axially directed forces are transmitted from the mounting plate to the outer frame by the plurality of webs, the inventive apparatus does not include any other supporting member or brace to transmit or support these axially directed forces.

In this regard, see the present specification at page 5, lines 5 to 10; page 8, line 23 to page 9, line 2; page 12, lines 1 to 3; page 14, lines 15 to 22; etc. This achieves an especially simple, compact, and robust integrated solution, which ensures that no errors or falsifications will arise in the measurement results due to the influence of any additional supporting element or the like. In other words, since no additional supporting elements (other than the plural webs) are needed or provided to support the axially directed forces, the invention also avoids side effects or secondary influences of such auxiliary supporting elements on the measurement results.

Still further, the webs are configured and arranged to allow the mounting plate to undergo translational vibration relative to the outer frame in the plane of the plate. This translational vibration is detected by a first vibration transducer arrangement coupled to the outer frame and the mounting plate.

As will be discussed next, the prior art of record does not disclose and would not have suggested the combination of features of present independent claim 1.

9) The Examiner has applied a combination of Himmler et al. and Maus against the present claims. However, a person of ordinary skill in the art would not have been motivated to combine the teachings of these references.

The present invention and the Maus reference each relate to apparatuses for determining the unbalance condition (and especially the static unbalance and the dynamic unbalance) of a rotating body. On the other hand, the Himmler et al. refer-

ence relates to an apparatus for determining the static unbalance of a **non-rotating** body. These are two significantly different classes or types of balancing apparatus. To carry out an unbalance determination using the apparatus of Himmler et al., the body absolutely **may not** rotate. On the other hand, to carry out an unbalance determination using the apparatus of the invention or the apparatus of Maus, the body absolutely **must** rotate.

The structural arrangements, the unbalance force measurements, and the conceptual functions or operation of these two different types of apparatus are different from each other and not interchangeable. The Examiner's suggestion that it would have been obvious to provide for rotation of the test body on the Himmler et al. apparatus is factually and conceptually incorrect. The central mandrel (3) could not be used as a rotational body, (contrary to the Examiner's assertion), because if that were the case, then the Himmler et al. apparatus could not carry out its intended function of a static unbalance determination of a non-rotating body using the deflection transducers (7 to 10). Namely, those deflection transducers are intended and arranged to measure the static gravitationally induced deflection of the (non-rotating) unbalanced body supported on the centering mandrel (3) (see col. 1, line 24; and col. 2, lines 60 to 66).

Moreover, the apparatus according to Himmler et al., does not include a vibration transducer, or allow a translational vibration of a mounting plate, because the static non-rotating body **does not vibrate**, but instead remains static, it "just sits there". In the inventive apparatus, the translational vibration is induced by the unbalance of the rotating test body.

For these reasons, a person of ordinary skill in the art would not have been motivated to combine the features or teachings of Maus with the features or teachings of Himmler et al., because it would be like "mixing apples and oranges". The components and teachings of one system (e.g. the rotational system according to Maus) would not have been expected to serve their intended functions in the completely different other system (e.g. the non-rotational system) of Himmler et al..

The Examiner has also shown no motivation provided by the references toward combining the various features. Instead, it appears that the Examiner has improperly used a hindsight understanding of the present invention to pick and choose various different features from the various references, and assembled those features together using the present claims as a blueprint, in order to come up with the inventive arrangement. That is not a legally permissible way to establish an obviousness rejection. Instead, the Examiner must show a suggestion or motivation in the prior art for combining the features.

So, for example, the Examiner's assertion that the central mandrel (3) of the Himmler et al. apparatus "*could be used as a rotational body*" is merely a speculation based on a hindsight reconstruction of the invention, and is not based on any suggestion by Himmler et al. To the contrary, a person of ordinary skill in the art would have immediately recognized that it would not make sense and it would not be functional to use the central mandrel (3) of the Himmler et al. apparatus as a rotating body, for the reasons discussed above.

Thus, because the two references and their respective teachings would not reasonably have been considered in combination by a person of ordinary skill in the art, the rejection based on such a combination of the references cannot be supported.

10) Furthermore, even if the teachings of these two references would have been considered in combination, the present invention would not have been suggested.

As mentioned above, present independent claim 1 requires a plurality of webs that support the mounting plate relative to the outer frame in such a manner to allow the mounting plate to undergo translational vibration relative to the outer frame in the plate plane.

The Examiner has asserted that the torsion elements (15, 16, 17, 18) of the Himmler et al. apparatus are analogous to the present webs. That analogy fails, because the torsion elements (15, 16, 17, 18) expressly do not allow the mounting plate to undergo translational vibration. To the contrary, the torsion elements (15 to 18) are rigid in the horizontal and vertical directions so that they readily transmit radial and axial forces exerted on them (col. 1, lines 57 to 61; col. 2, lines 40 to 43). Each torsion element (15 to 18) is intended only to permit rotation about its respective axis (col. 2, lines 35 to 37). The intended result is to form a gimbal system (11) or gimbal suspension in the manner of a universal joint, that is capable of pivoting rotation about two mutually perpendicular axes defined by the torsion elements (15 to 18). Thus, the torsion elements purposely only allow a first tilting motion about the torsion

elements (15 and 16) and a second tilting motion about the torsion elements (17 and 18), while expressly transmitting radial and axial forces exerted on the torsion elements, whereby any translational vibration of the mounting plate would be directly braced through the flexurally stiff torsion elements into the surrounding frame, and thereby prevented.

If instead the Examiner would turn to the webs in the Maus arrangement, it is further clear that the Maus webs are also not suggestive of the presently claimed web arrangement.

First, the presently claimed arrangement of webs is symmetrical relative to the rotation axis. To the contrary, the webs or "linking strips" (e.g. 14A, 14B, 14C, 14D) in the arrangement according to Maus are not symmetrically arranged relative to the rotation axis (27). Instead, the linking strips are arranged very unsymmetrically near one end of the plate, while the rotation axis is arranged near the opposite end of the plate. Such a non-symmetry is contrary to the invention, and would not be able to achieve the high accuracy and avoidance of non-symmetries in the measuring results, as achieved by the present invention.

Secondly, the webs in the present inventive arrangement transmit all axially directed forces (i.e. forces oriented along the rotation axis that are not induced by the unbalance of the rotational body), from the mounting plate to the outer frame. This would not have been suggested by the web arrangement according to Maus. Namely, the Maus disclosure expressly suggests providing additional supporting structures to support axially directed forces, separately from the webs or linking strips (see

e.g. col. 3, lines 21 to 28; col. 4, lines 60 to 66; col. 5, lines 1 to 7; col. 6, lines 1 and 2; etc.).

These teachings and suggestions of Maus would have motivated a person of ordinary skill in the art directly away from the present inventive arrangement, because Maus expressly teaches that it is desirable and advantageous to support the axially directed forces separately from the webs or linking strips "so that they do not influence the measuring results" (col. 4, lines 60 to 61). The inventive arrangement is directly to the contrary, whereby all of the axially directed forces are purposely transmitted directly by the webs from the mounting plate into the outer frame.

Instead of providing additional support means in the invention, the webs themselves, the mounting plate, and the measuring transducers are arranged to isolate the translational vibrations (and optionally the pivotal vibrations) for measurement, and to avoid any falsifying influences on the measuring results arising from the axially directed forces. The invention is based on the recognition that the auxiliary supporting elements, in an arrangement according to Maus for example, lead to falsifying influences in the measuring results, because the auxiliary supporting elements may also have an influence on the other force components of the dynamic unbalance condition of the rotating body. Thus, contrary to the prior art, the invention calls for all the forces of the rotating body to be transmitted into the mounting plate where the translational vibration component (and optionally also the pivoting vibrational component) can be measured, while the axially directed forces are all separated and

transmitted directly by the webs from the mounting plate into the outer frame.

Thus, even if the teachings regarding an appropriate support for a rotating body according to Maus would somehow have been incorporated into the static non-rotating balancing apparatus according to Himmler et al., the particular features of the present web arrangement would still not have been suggested.

11) For the above reasons, independent claim 1 would not have been obvious from a combination of the references. The dependent claims recite additional features that further distinguish the invention over the prior art, for example as follows.

Regarding claim 4, the transducer arrangement according to Himmler et al. is not relevant, and the transducer arrangement with transducers coupled to the mounting plate and the outer frame (e.g. Fig. 1 of Maus), does not have the first vibration transducer for detecting the translational vibration of the mounting plate oriented with its measuring axis perpendicular to the pivot axis (as presently claimed), but instead oriented offset from the pivot axis, as can be seen in Fig. 1.

Regarding claim 5, the references do not suggest any arrangement of a vibration transducer for detecting a translational vibration, with a first effective measuring axis oriented coincident with the pivot axis. The Examiner has referred to transducer (5) of Fig. 2 of the Himmler et al. reference, but the measuring axis of that transducer is clearly not coincident with the pivot axis, which is established, if at all, by the axes of

the torsion elements (15 and 16) or the torsion elements (17 and 18).

Regarding claim 14, none of the references disclose or suggest anything about three pairs of webs, with respective different flexing or stiffness characteristics in different directions as defined in present claim 14. These characteristic features of the webs are extremely important in the present invention, because they enable the pivoting vibration of the mounting plate about the pivot axis defined by the first pair of webs, as well as the translational vibration in the plane of the plate, while still supporting all of the forces. That is not true in the references. The Examiner has not addressed these different flexibility characteristics in different directions, and they are not suggested by the references.

Regarding claim 16, the Examiner has referred to the rectangular plan shape of Maus, but Maus does not suggest the arrangement of second and third pairs of webs arranged at respective opposite ends of long sides of this rectangular plan shape, with a first pair of webs arranged at a center of the long sides. This is a particular form of the inventive symmetrical arrangement, which is quite distinct from the non-symmetrical arrangement according to Maus.

The features of claim 23 are expressly and directly contrary to the teachings of Maus regarding the provision of an additional support for the mounting plate and for the rotational body.

12) Present independent claim 26 is directed to a method of determining an unbalance of a rotational body comprising steps of **rotat-**

ing the rotational body about a rotation axis, and transferring all forces and moments originating from the rotational body into and through a dynamometer element on which it is supported. These method steps are directly contrary to the teachings of the references.

Himmler et al. does not disclose or suggest rotating the test body, and would not be functional if the test body were to be rotated.

On the other hand, while Maus does disclose rotating the test body, Maus teaches away from the step of transferring all forces and moments originating from the original body into and through the dynamometer element. To the contrary, as discussed above, Maus suggests providing additional supporting elements to support and transmit the axially directed forces from the rotating test body directly into a foundation or base member. Those forces are purposely shunted around or away from the dynamometer element, allegedly to avoid causing errors in the measurement results.

The present invention is directly contrary to such suggestions of the prior art. For these reasons, the method according to claim 26 would not have been obvious.

13) For the above reasons, the Examiner is respectfully requested to withdraw the rejection of claims 1 to 5, 7 to 10, 14, 16, 18 to 21 and 23 to 26 as obvious over Himmler et al. in view of Maus.

14) Referring to pages 6 to 7 of the Office Action, the rejection of claims 6, 11 to 15 and 17 as obvious over Himmler t al. in view

of Maus, and further in view of U. S. Patent 4,640,138 (Meyer et al.) is respectfully traversed.

15) The Meyer et al. reference and its teachings would not have been combined with the teachings of Himmler et al. and Maus, by a person of ordinary skill in the art.

The Meyer et al. disclosure relates to a multiple axis load transducer measuring six components of force (i.e. including moments and axial measurements in the three principle directions). Such a multi-axis force transducer has no relation or application to the inventive field of rotational balancing machines, in which only one or two components of force are to be measured, while the other four components must be omitted or removed from the measurement.

A person of ordinary skill in the art would not have been motivated to use a multi-axis force transducer providing measurements for six force components, in connection with a rotational balancing machine, which is purposely measuring at most two force components and purposely excluding at least four other force components to avoid falsifying influences on the intended force components to be measured.

Thus, a person of ordinary skill in the art would not have looked to the disclosure of Meyer et al. for additional suggestions regarding the inventive arrangement.

16) Even if a person of ordinary skill in the art would have considered the teachings of Meyer et al. in combination with those of

Himmler et al. and Maus, the present invention would not have been suggested.

Claims 6, 11 to 15, and 17 all depend from independent claim 1, which has been discussed above in comparison to a combination of Himmler et al. and Maus. The teachings of Meyer et al. provide no additional suggestions toward the above discussed significant features of claim 1, for example providing a mounting plate to support a rotating test body, and supporting the mounting plate relative to the frame by means of webs that are arranged symmetrically relative to the rotation axis, and that transmit all of the axially directed forces (which are oriented along the rotation axis and not induced by the unbalance of the rotational body) from the mounting plate to the outer frame.

The dependent claims recite additional features that further distinguish the invention over the prior art, for example as follows.

Regarding claim 6, the Examiner has referred to elements (25 and 35) of Meyer et al. as analogous to the presently defined extension arm extending into a clearance space. The elements (25 and 35) of Meyer et al. are actually a hub (25) and radial arms or beams (35). Strain gages are mounted on the beams (35). Thus, these beams (35) are actually purposely strainable members that form a part of the transducer itself, and would not function as or suggest the presently recited extension arm.

Regarding claim 11, the Examiner refers to a third pair of webs (36) in the Meyer et al. arrangement, but Meyer et al. does not suggest three pairs of webs that all extend parallel to each other, as required by present claim 11.

Regarding claims 13 and 17, the alleged webs (36) of Meyer do not have any notch therein.

Regarding claim 14, the alleged webs according to Meyer et al. are not arranged like and do not have all the features of the arrangement defined in claim 14 (e.g. the differential flexibility characteristics of the webs in different directions). The Examiner must consider the details as defined in this claim.

17) For the above reasons, the Examiner is respectfully requested to withdraw the rejection of claims 6, 11 to 15, and 17 as obvious over Himmler et al. in view of Maus and further in view of Meyer et al.

18) New independent claim 27 recites features taken from original claims 1, 2 and 11. None of the references, even when considered in combination, would have suggested an arrangement of three pairs of webs that are all parallel to each other, with the second and third pairs of webs located on opposite sides of the pivot axis equidistantly therefrom, while the first pair of webs extends along the pivot axis. The Examiner has referred to the beams (36) of Meyer et al, but even Meyer et al. do not have these beams or webs arranged as presently claimed. Instead of providing three pairs of parallel webs, Meyer et al. provide respective perpendicular crossed pairs of webs, which has an extremely different structural and functional result.

19) Present independent claim 28 defines an arrangement including a first pair of webs extending along the pivot axis, and further

webs offset away from the pivot axis, whereby the webs have defined different flexing characteristics in different directions. The Examiner is respectfully requested to consider the defined flexing characteristics, which are neither disclosed nor suggested by the references. The dependent claims 29 to 31 define additional features that further distinguish the invention over the prior art, e.g. the orientation of the webs relative to each other, and the symmetry of the webs.

20) Favorable reconsideration and allowance of the application, including all present claims 1 to 31, are respectfully requested.

Respectfully submitted,

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Encls.:
Term Extension Request,
Form PTO-2038, Marked-Up
Version of amended spec.
page 22, Marked-Up Version
of amended claim 1

CERTIFICATE OF FAX TRANSMISSION:

I hereby certify that this correspondence with all indicated enclosures is being transmitted by telefax to (703) 872-9318 on the date indicated below, and is addressed to: Assistant Commissioner for Patents, Washington, D. C. 20231.

_____ 12/19/02
Name: Walter F. Fasse - Date: December 19, 2002

By Fax TO: (703) 872-9318

Docket #3896
USSN: 09/633,681
A.U.: 2855; Conf.#3613
Ex.: T. D. Bellamy

"Marked-Up Version"

As a comparison to the inventive system, a non-inventive system that is subject to interfering influences, for example due to the use of additional supporting members, has only a small or diminished degree of symmetry in comparison to the inventive system, with respect to the mass distribution and the stiffness distribution. As a result, in such a non-inventive system, the pivoting axis 10 no longer lies in the horizontal effective plane of the horizontal vibration transducer 12, but rather is positioned out of this plane, which leads to the measurement of, for example, too large vibrational displacements.

The invention for the first time ensures that the pivot axis, or in general the reference plane of the plate-shaped dynamometer element 1, will remain in the horizontal effective plane 34 of the horizontal vibration transducer 12. In this manner, an ideal separation and discrimination between a vibrational movement induced by a dynamic unbalance and [to] a vibrational movement induced by a static unbalance becomes possible. Thereby, an exact determination of the static unbalance can be achieved.

Fig. 7 shows a further variant, which corresponds with the embodiment shown in Fig. 1, except that in Fig. 7, the entire dynamometer element has been tilted so that the plate plane extends vertically and the rotation axis extends horizontally. This arrangement demonstrates that the present dynamometer element is versatile and can be adapted for use in a variety of different unbalance measuring machines and balancing machines.

By Fax to: (703) 872-9318

Docket # 3896
USSN: 09/633,681
A.U.: 2855, conf # 3613
Ex: T. D. Bellamy

"Marked-up Version"

1. (amended) An apparatus for determining an unbalance of a rotational body when said rotational body is mounted on said apparatus so as to be rotatable about a rotation axis, said apparatus comprising:

p5 l5-19; p6 l 1-5; p7 l 4-9; p8 l 23-p9 l 2; p12 l 1-3; p14 l 15-22

a mounting plate extending along and defining a plate plane;

a mounting fixture that is arranged on said mounting plate, and that is adapted to receive the rotational body mounted thereon so as to allow the rotational body to rotate about said rotational axis, wherein said rotational axis is oriented perpendicular to said plate plane;

an outer frame arranged at least partially outwardly around said mounting plate;

a plurality of webs respectively connecting said mounting plate to said outer frame, wherein said webs are so configured and arranged so as to support said mounting plate relative to said outer frame, to transmit from said mounting plate to said outer frame forces that are oriented along said rotational axis and that are not induced by the unbalance of the rotational body, and to allow said mounting plate to undergo translational vibration relative to said outer frame in said plate plane, wherein said translational vibration is induced in said mounting plate by the unbalance of the rotational body; and

a first vibration transducer arrangement that is coupled to said outer frame and to said mounting plate, and that is so arranged and adapted to detect said translational vibration of said mounting plate relative to said outer frame in said plate plane.

in an arrangement of said webs that is symmetrical relative to said rotation axis

all axially directed